Abstract of the Disclosure

A system for optical interrogation of a sample adaptable for multiple wavelength illumination and multiple wavelength fluorescent or luminescent light collection, wherein the illumination wavelength profile and the light collection profile may overlap. In the system, coherent light from one or more lasers is focused onto a target layer on a sample to excite fluorescent or luminescent light from the target layer. Emitted light is collected from a selected depth by a reflective light collector that transmits the collected light to detection optics. The reflective light collector directs collected light at an angle to the optical axis of the illumination light, thereby separating collected emitted light from illumination light. The light collector may collect light from a focus, whereby the focused illumination light combined with the focused light collection aid in limitation of the depth of field to a selected depth. Additionally, a spatial filter positioned between the light collector and the detection optics may be used to confine the depth of field to a selected depth. This device may be incorporated into an optical scanner by scanning of illumination light in a first direction and translation of the sample in a tangent direction. Alternatively, the illumination and detection optics may remain stationary and the detectable targets moved past a scanning location (e.g. as in electrophoretic analysis).